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A New Species, *Trichomanes trichopodium*, Related to *T. crinitum* (Hymenophyllaceae)

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Abstract. The *Trichomanes crinitum* complex in the neotropics is analyzed, and *T. trichopodium* is described as a new species. It differs from *T. crinitum* by a winged petiole in mature plants, less divided pinna, and involucre lips that are narrower and glabrous.

Resumen. El complejo *Trichomanes* crinitum en el neotropico es analizado, y *Trichomanes trichopodium* es descrito. La especie nueva difiere de *T. crinitum* por tener pecíolo alado en las plantas maduras, lámina menos dividida y margen del involucro más angosto y glabro.

Key words: new species, *Trichomanes tricopodium,* Hymenophyllaceae, filmy fern, Pteridophyta

Introduction

Recent studies by the author of living and herbarium material in the *Trichomanes crinitum* complex have led him to reassign a fern that represents the most common plant in Costa Rica to a new species, *T. trichopodium.* Previously, Rojas (1996) mistakenly reported, based on the division of the pinna, that *Trichomanes delicatum* Bosch grew in Costa Rica. Having found two distinct forms of *T. crinitum* Sw., he considered that the most common of these forms corresponded to *T. delicatum.* Plants in the Cordillera de Talamanca having a rachis without a wing and very incised pinna, therefore, were assigned to *T. delicatum.* Further studies, however, have shown that *Trichomanes delicatum* does not exist in Costa Rica, that *T. crinitum* (Figure 1) is distributed only from southern Costa Rica through South America and the West Indies, and that the most common species in Costa Rica is the following new species.

Taxonomic Treatment

Trichomanes trichopodium A.Rojas, sp. nov. Type: Costa Rica—Limón in Talamanca, Bratsi, Amubri, Alto Lari, Kivut, bajando hacia el Río Dapari, 9°24′20″N, 83°05′35″W, 1000 m, 10 Mar. 1992, *G. Herrera 5266* (Holotype: CR; Isotypes: K, MO). Figures 2, 3.

A *Trichomanes crinito* Sw. stipite dorsaliter alato per ½ vel ⅕ longitudinis (versus exalato in plantis adultis), rachi semper alata (versus saepe exalata usque ad parte media), pinnis crenatis vel lobulatis (versus pinnatifidis), involucri margine minore et glabro (versus viloso) recedit.

Plant terrestrial. ***Rhizome*** 1–2 mm wide, compact, erect, ferruginous, villous, the trichomes 1–5 mm long, simple, brown/yellowish, 2-celled; the basal cell broader and shorter, dark brown; the apical narrow, yellowish. ***Fronds*** 4–11 cm long, monomorphic, arching, pendent to erect. ***Stipes*** 1–7 cm long, brown, villous; the trichomes like those of the rhizome, winged distally ½–⅕ of the frond length, 0.3–1 mm wide, green. ***Blades*** 3–10 × 1.2–2.3 cm, lanceolate to linear-lanceolate, cuneate to truncate at the base, acute to obtuse at the apex, yellowish green, 1-pinnate crenate to 1-pinnate lobulate, membranaceous, translucent, sparsely villous, the trichomes 1–1.5 mm long, present only on veins and margin (not on laminar tissue between the veins), 2-celled, the basal cell broader and shorter, brown to dark purple, the apical cell narrow, yellowish, acute. ***Rachis*** brown, winged, the wings ca. 1 mm wide, denticulate; each tooth with a trichome like that on the rhizome; similar trichomes also present on the axis and margins of pinna. ***Pinnae*** 8–23 pairs, 0.6–1.3 × 0.3–0.6 cm, lanceolate to oblong-obovate, crenate to lobulate; the base adnate, ascending. ***Veins*** free, pinnate, bifurcate, false veins absent. ***Involucres*** 1.5–2.5 × 0.5–1 mm, fully immersed or few exerted and winged, funnel-shaped; the base acute; the margin without dark cells or disperse; the apex not expanded, 2-labiate; the lips 0.3–0.5 mm wide, ascending without trichomes. ***Receptacle*** exerted.

Distribution: Known only from Costa Rica and Panama from (1000–) 1400–2000 m. In Costa Rica, the species occurs in the Cordillera de Tilarán on northern and Caribbean slopes of Cordillera Central. In both countries, it occurs in the Cordillera de Talamanca.

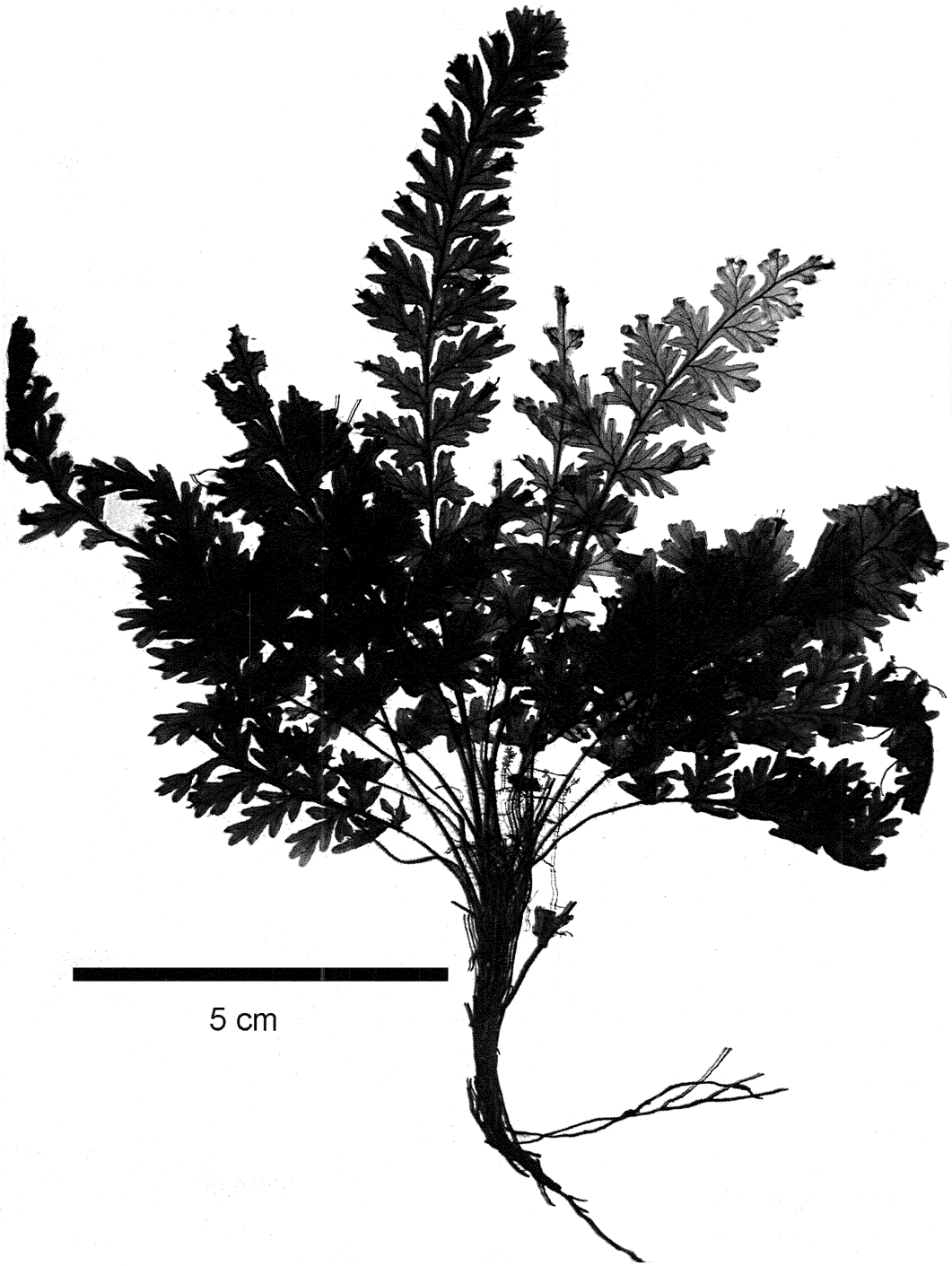

FIGURE 1. Habit of *Trichomanes crinitum* Sw. (*G. Herrera 3364,* CR).

FIGURE 2. Habit of *Trichomanes trichopodium* A.Rojas. (*G. Herrera 5266,* CR).

ETYMOLOGY: The name of this species refers to a dark and broad cell on the trichome base, a character also present in *Trichomanes crinitum.*

PARATYPES: Costa Rica—without exact locality: Jun–Aug 1967, *A. Smith s.n.* (UC).—Alajuela: Finca La Selva, arriba de San Rafael de Vara Blanca, pendiente NW del Volcán Barva, 1700 m, 23 Jun 1963, *A. Jiménez 792* (CR); San Ramón, Reserva Biológica Monteverde, Cordillera de Tilarán, Estación Aleman's, 10°22′N, 84°48′W, 1200–1500 m, 20 May 1995, *A. Rojas 1869* (CR, INB, MO).—Cartago: Parque Nacional Tapantí Macizo de La Muerte, sector Quebrada Segunda, sendero Árboles Caídos, 9°45′20″N, 83°47′00″W, 1200–1300 m, 25 Nov 1996, *R. Guzmán 62* (INB), 25 Aug 1997, *R. Guzmán 126* (INB); Paraíso, Parque Nacional Tapantí, cuenca del Reventazón, Sendero

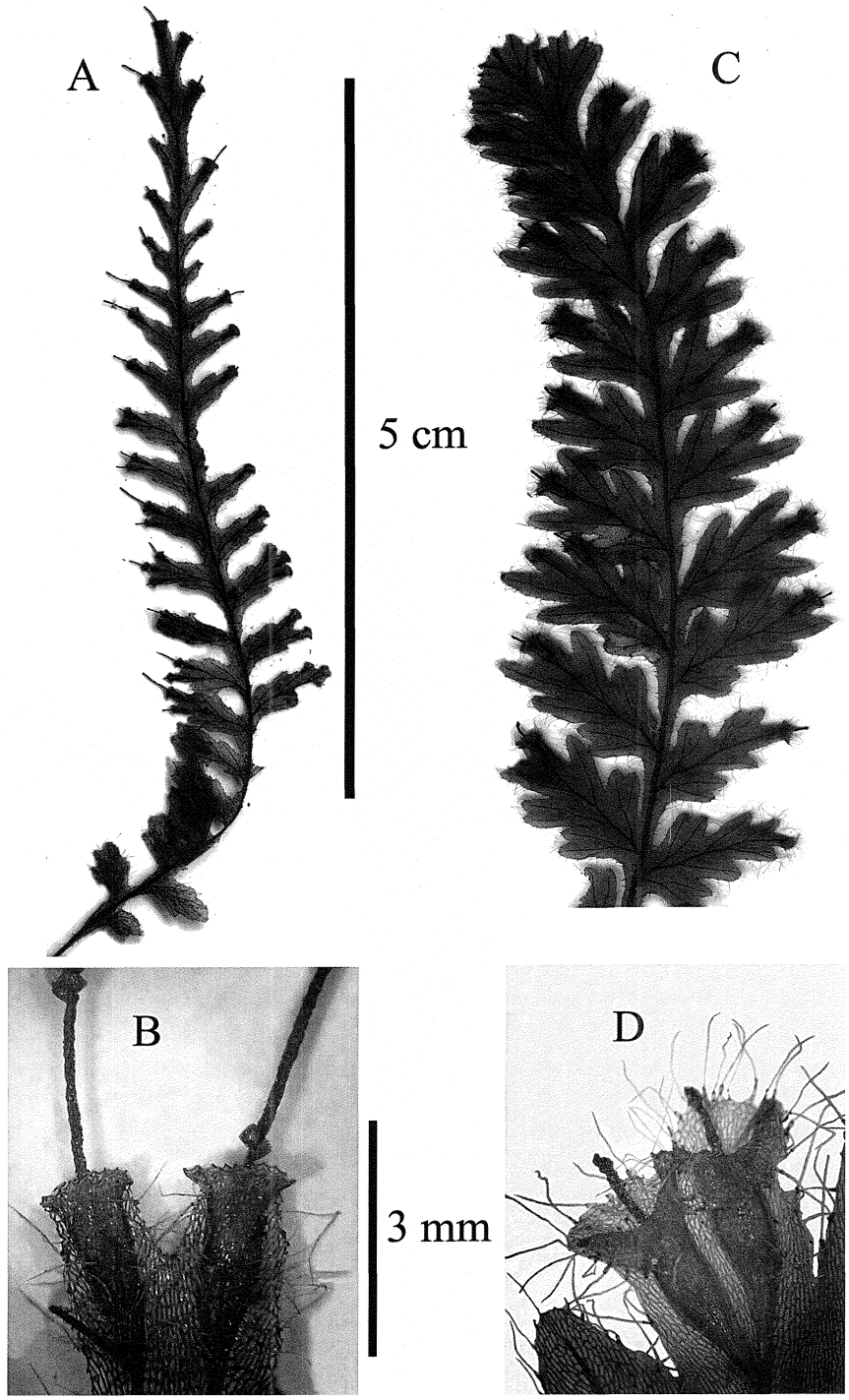

FIGURE 3. *Trichomanes trichopodium* A.Rojas (*G. Herrera 5266,* CR) (**A,B**) and *T. crinitum* Sw. (*G. Herrera 3364,* CR) (**C,D**). **A.** Section of blade. **B.** Involucre. **C.** Section of blade. **D.** Involucre.

Árboles Caídos y Oropéndula, 9°45′20″N, 83°47′00″W, 1300–1500 m, 7 Apr 1999, *A. Rojas & A. Soto 5016* (INB); Valle del Reventazón, Mirador Ecológico Monte Sky, 9°44′40″N, 83°50′00″W, 1700–2000 m, 23 Sep 1995, *A. Rojas et al. 2492* (CR, INB); Parque Nacional Tapantí, cuenca del Reventazón, Sendero Árboles Caídos, 9°45′20″N, 83°47′00″W, 1300–1500 m, 19 Nov 1997, *A. Rojas et al. 3976* (INB).—Heredia: N of Vara Blanca, N slope of Central Cordillera, 6000 ft (1830 m), 10 Jul 1940, *M. Chrysler & W. Roever 5007* (UC); San Rafael de Vara Blanca, 1800–2000 m, without date, *A. Goldgewicht & L. Gómez 134* (CR); along Río San Rafael, Atlantic slope of Volcán Barva, 10°13′N, 84°05′W, 1500 m, 12 Apr 1986, *M. Grayum 7010* (CR, MO); Baulio Carrillo National Park, 10°15′N, 84°10′W, 1830 m, 1 Feb 1988, *E. Hennipman et al. 6752* (UC); along Río Vueltas (upper Río Patra), at end of Rte. 113, 9 km N of Los Ángeles, 10°06′N, 84°04′W, 1900 m, 1 Apr 1973, *R. Stolze 1622* (CR, UC); Cascajal, 1500 m, Nov 1978, *W. Wagner & L. Gómez 78512* (CR).—Limón: Talamanca, camp by Kivut, trail up from the camp, 3 km SW of the camp, 9°24′15″N, 83°05′05″W, 1300–1400 m, 10 Mar 1992, *J. Bittner 1502* (CR, MO); Talamanca, Bratsi, Amubri, Alto Lari, siguiendo la fila entre los Ríos Dapari y Lari, 9°24′15″N, 83°04′55″W, 1300 m, 27 Feb 1992, *G. Herrera 5098* (CR, INB); Talamanca, Bratsi, Amubri, Alto Lari, Kivut, bajando hacia el Río Dapari, 9°24′20″N, 83°05′35″W, 1000 m, 10 Mar 1992, *G. Herrera 5266* (CR, INB, MO); Talamanca, Bratsi, Amubri, Alto Lari, Kivut, fila mayor entre los Ríos Dapari y Lari, desviándose hacia el E por fila secundaria, cuenca del Río Lari, 9°23′50″N, 83°05′10″W, 1350 m, 17 Mar 1992, *G. Herrera 5395* (CR, MO).—San José: La Palma, 1400 m, 26 Mar 1908, *L. Brade 59* (UC); ca. 10 km N of San Rafael de Heredia on Volcán Barba, 1950 m, 13 Jul 1967, *J. Mickel 2650* (UC); along Río Zurquí (downstream from Guápiles hwy), Cordillera Central, 10°03′N, 84°01′W, ca. 1400–1500 m, 18 Jan 1986, *A. Smith et al. 1745* (CR, MO); Zurquí, 4 Apr 1973, *L. Gómez 3520* (CR); Coronado, 3 km al NE del Río Cascajal, hacia Río Blanco-Las Nubes, 1600 m, 10 Apr 1963, *A. Jiménez 645* (CR); near Quebrada Bajo Máquina, 2 km NE of Cascajal, 1680 m, 29 Aug 1971, *R. Lent 2088* (CR); along Río Zurquí, (downstream from Guápiles hwy), Cordillera Central, 10°03′N, 84°01′W, ca. 1400–1500 m, 18 Jan 1986, *A. Smith et al. 1745* (MO, UC); La Palma, 1500 m, 1 May 1928, *M. Valerio 319* (CR). Panama—Dexter trail, 11 Apr 1918, *M. Cornman 1300* (UC).

Trichomanes trichopodium differs from *T. crinitum* by stipes winged in the distal ⅕–½ part (vs. stipe without a wing in mature plants), rachises fully winged (vs. commonly without a wing in the basal half), pinnae crenate to lobulate (vs. pinnatifid), involucres 0.3–0.5 mm wide (vs. 0.5–1 mm), ascending or at least not expanded (vs. commonly expanded) with glabrous margin (vs. pilose), as in FIGURES 1–3.

Trichomanes trichopodium (*G. Herrera 5395,* CR, MO) was found in the same locality as *T. crinitum* (*G. Herrera 5397,* CR, MO), suggesting that the differences between these two species are genetic and not environmental.

Gómez (1975) reported apogamy in *Trichomanes crinitum* populations at Zurquí; however, at this locality only *T. trichopodium* occurs, suggesting that Gómez's report refers to this new species.

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